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Socialization to binge drinking: A population-based, longitudinal study with emphasis on parental influences

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ABSTRACT

Background: Binge drinking is associated with considerable harm. However, too little is known about socialization to this pattern of alcohol consumption.**Aim:** To identify longitudinal predictors of young adult binge drinking, with an emphasis on possible parental influences.**Methods:** A population-based prospective study, in which respondents ($N = 2558$) were surveyed from mid-adolescence until their late 20s. The data set was linked to national registers. Data were collected on parental alcohol consumption, parental binge drinking and parental alcohol problems, as well as on other aspects of the family milieu. The respondents' frequency of alcohol consumption was assessed, as well as a number of binge drinking measures: (i) frequency of intoxication episodes, (ii) frequency of consuming 5+ units, and (iii) "usual" consumption patterns of 5–6+ units, 7–9+ units, and 10+ units.**Results:** A surprisingly high proportion of the sample met the criteria for binge drinking. After control for parental, peer and individual characteristics, parental binge drinking predicted respondents' binge drinking, using all definitions, at age 28 years ($p < .001$). Parental frequency of alcohol consumption predicted frequency of alcohol consumption in their offspring at age 28 ($p < .001$).**Conclusion:** The findings suggest a socialization pattern of alcohol role modeling from parents to offspring. The findings are also consistent with genetic research showing alcohol use to have moderate heritability. We may witness new binge drinking cultures in Norway, but binge drinking patterns also seem to echo parental influences.© 2013 The Authors. Published by Elsevier Ireland Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Binge drinking in adolescents and young adults is regarded as a major health concern in the USA (Courtney and Polich, 2009) and in various European countries (Kuntsche et al., 2004). Binge drinking contributes to alcohol-related deaths (Chikritzhs et al., 2001), and is associated with unintentional injuries, suicide, interpersonal violence, drunk driving, traffic accidents (NIAAA, 2000), and social exclusion (Viner and Taylor, 2007). The term "binge drinking" is ambiguous, but the literature usually focuses on two definitions: (i) drinking that leads to intoxication or (ii) heavy drinking that occurs over an extended period of time, linked to clinical

definitions of abuse or dependence (Gmel et al., 2003). In this paper, we want to shed light on binge drinking patterns in the normal population, not necessarily regarded as pathological and fulfilling criteria of alcohol abuse or dependence. Therefore, we use the former definition.

Several longitudinal studies have investigated the etiology of binge drinking (Courtney and Polich, 2009), but the bulk of the research stems from US college samples (Wechsler et al., 1995a, 2002). Thus, longitudinal studies of adolescents based on representative samples from countries other than the USA are warranted.

The present study was conducted in Norway, one of the Nordic countries that, along with the UK and Ireland, are usually characterized as having binge drinking problems among adults (Mäkelä et al., 2001), as well as among adolescents and students (Hibell, 2011). Binge drinkers differ from non-binge drinkers in both gender and age: men are more likely than women to binge drink, and men report more annual days of drunkenness than do women (Mäkelä and Mustonen, 2000). The greatest prevalence of binge drinking is found in adolescents and young adults, usually with a peak from 18 to 29 years (Hemström et al., 2002). Several studies show that binge drinkers are characterized by poor school achievement, by

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dropping out of school, and by a low level of education (Droomers et al., 1999; Laukkanen et al., 2001; Wichstrøm, 1998).

The importance of parental drinking in the alcohol socialization process has been investigated in a large number of studies (for a review, see: Ryan et al., 2010). However, only a handful of studies from the USA have investigated parental factors predictive of binge drinking, and they show disparate results. Some of these studies report no effects of parental drinking on binge drinking (Havey and Dodd, 1993; Odo et al., 1999), whereas others report that binge drinkers are influenced by drinking behavior in the family (Ichiyama and Kruse, 1998; Kushner and Sher, 1993). There is also some evidence that adolescents with a family history of alcohol abuse underestimate their own level of drunkenness and therefore are more likely to engage in binge drinking than other adolescents (Turrisi and Wiersma, 1999). Another source of information about the association between parents' and offspring's alcohol use is twin and adoption studies, which have shown alcohol use to have a moderate heritability, with about 50% of the variance in alcohol consumption measures being accounted for by genetic factors (Dick et al., 2009). An association between parental and offspring drinking behavior may thus be explained by the fact that parents and their children are genetically related.

Other forms of parental influence on offsprings' drinking behavior have also been investigated in a large number of studies. In an early meta-analysis (Foxcroft and Lowe, 1991), a framework with three dimensions was identified, comprising support, monitoring, and family structure. High levels of monitoring and support were associated with reduced alcohol consumption, and adolescents from non-intact families drank more than others. However, in more recent research, a more complex picture has been uncovered. Some studies report that high parental support predicts low levels of alcohol use (Marshall and Chassin, 2000; Nash et al., 2005), whereas others have failed to find such an effect (Barnes et al., 2006; Ennet et al., 2001). A similar pattern has been found for monitoring: some studies point to the importance of such variables, and other studies do not (Chuang et al., 2005; Getz and Bray, 2005). Thus, the findings gradually seem to have become less conclusive. This may in part reflect the heterogeneity of endpoints in the studies – ranging from age of alcohol initiation, to level of alcohol consumption, or to measures of more pathological alcohol-related behaviors. Note also that the use of alcohol at certain ages is normal and normative behavior in most groups. All these factors in combination might imply that it is difficult to develop clear patterns with regard to the findings in this area.

Peer drinking is also viewed as a potent influence on alcohol use (Crosnoe and McNeely, 2008). In a review of European studies, pressure from peers was identified as one of the strongest factors influencing binge drinking, and, in fact, it seemed to outweigh parental influences (Kuntsche et al., 2004). However, few studies have investigated the pathway from peer influences in adolescence to binge drinking in adulthood. Religious involvement also seems to restrain development of alcohol consumption (Adamczyk, 2012) a finding that has also been reported from a Norwegian context (Pedersen and Kolstad, 2000). Thus, the importance of such influences will also be investigated.

Based on cross-sectional evidence, several studies suggest that parental relationship quality is more strongly associated with girls' than boys' alcohol use (Choquet et al., 2008; Kelly et al., 2011b). A recent longitudinal study suggested that girls who have an emotionally close relationship with their mother use less alcohol (Kelly et al., 2011a). Thus, a special emphasis on gender is warranted.

The aims of the study are as follows: (1) to identify predictors of young adult binge drinking, with a special emphasis on possible parental influences; and (2) to investigate whether there are gender differences in this area.

2. Methods

2.1. Participants

This investigation is based on the *Young in Norway Longitudinal Study*, which has been described in greater detail elsewhere (Wichstrøm, 1999). In short, students from 67 representative Norwegian schools in grades 7 through 12 comprised the initial sample. The participants were followed over a 13-year period with three additional data collections, from mid-adolescence until their late 20s. To obtain information about the respondents' and their parents' education, as well as information about unemployment and disability pensions, the data set was linked to Statistics Norway's nationwide Historical Event Databases. The study was approved by the Regional Ethical Committee for Health Research and the Norwegian Data Inspectorate, and all participants gave their written consent for participation.

The initial response rate was 97.0%, and the cumulative response rate over all four data collections was 69%. A previous study revealed that the attrition was higher in males (OR 1.55, 95% CI 1.38–1.74) and among those with low parental SES (OR 1.06, 95% CI 1.03–1.10; Wichstrøm et al., 2013). At the fourth data collection, the respondents were also asked for their consent to link the data to national registers, to which 90% agreed. Thus, the overall participation rate, including register linkage, was 60%. In the analyses reported here, we draw on data from 2558 persons, 1136 males (44.3%) and 1422 females (55.6%). We use data from collection points when the respondents were on average 15 years ($SD = 1.7$), 17 years and 28 years old.

2.2. Measures

2.2.1. Alcohol consumption frequency and binge drinking. Alcohol consumption was measured using the Quantity/Frequency (QF) approach (Knupfer, 1966; Straus and Bacon, 1953). We asked, "How many times during the last four weeks did you drink more than a few sips of alcohol?" and "The last time you drank alcohol, how many 'drinks' did you have? By 'drink' we mean 0.331 of beer, a glass of wine, or a drink of liquor." The product of these two items gives a proxy for the number of "drinks" consumed during the last four weeks. To avoid excessively high values, the maximum number of drinks was set to 100. In this study, we labeled this measure "alcohol consumption." There are different ways to measure binge drinking. An initial view defined binge drinking as at least five alcohol units consumed during the same session (Cahalan et al., 1969), but the cutoff has sometimes been reduced to 4+ units for women because of their lower alcohol metabolism (Wechsler et al., 1995b). This approach—defining binge drinking as having more than x number of drinks on a single occasion—has been preferred by most researchers (Courtney and Polich, 2009; Kuntsche et al., 2004). However, based on such measures, the experiences of drunkenness and loss of control are not necessarily captured. Therefore, another approach has been used to define binge drinking in ways that cover these aspects as well. In the present study, we used both approaches. We asked, "During the past 12 months, how often have you drunk so much that you clearly felt drunk?" Response options were: Never, 1 time, 2–5 times, 6–10 times, 11–50 times, and More than 50 times. In most analyses in the paper, this is our definition of "binge drinking." However, we also asked, "During the past year, how often have you had five drinks or more in one evening (five half bottles of beer or one bottle of wine)." Response options were: Never, 1 time, 2–5 times, 6–10 times, 11–50 times, and More than 50 times. Finally, we asked, "How many alcohol units do you usually drink when you are drinking?" Response options were: 1–2, 3–4, 5–6, 7–9, 10 or more. This enabled us to define different cutoffs for binge drinking, and here we report findings for three different cutoffs: "Usually 5–6 units or more," "Usually 7–9 units or more" and "Usually 10 units or more."

2.2.2. Parents. At the first two time points, we asked, "Does your father [separate question for mother] drink alcohol?" The response options ranged from "no" to "every day". A "Parental alcohol consumption frequency" sum score was computed (values 0–12). We also asked at the first three time points: "Have you ever seen your parents drunk?", with response options ranging from "never" to "a few times a week". These items were summed to a "parental binge drinking" index (values 0–12). We also asked a retrospective question (at age 28) on possible parental alcohol problems: "Would you say that your father [separate question for mother] has had alcohol problems?" The response options ranged from "no, not at all" to "yes, definitely". Father's and mother's alcohol problems were scored on a scale from 0 to 4, and used separately in the analyses. Previous studies suggest that adolescents' perceptions of parental alcohol problems is a valid indicator of such problems, and also highly correlated with the parents' own reports (Cowley and Gordon, 1995; Crews and Sher, 1992).

Based on an instrument developed by Sarason et al. (1983), perceived parental support was assessed by four items describing situations relating to feeling down or having done something illegal. The index had values of 0–4. Parental monitoring was measured by an instrument consisting of six questions about perceived parental norms and parental knowledge of each adolescent's actions (Olweus, 1989; values 0–30). In addition, four items were included about degree of family-oriented leisure activities. A sum score was computed, ranging from 0 to 14. We also asked whether the respondents had experienced parental divorce or

breakup. Adolescents tend to self-report inaccurate information about parental educational level (Aaro et al., 2009). Thus, information about parental education level was obtained through national registers and classified as follows: Mother and/or father have: 0: elementary school; 1: high school; 2: college; 3: university.

2.2.3. Peers' and individuals' characteristics. Peers' alcohol and drug exposure was measured through questions about whether their two best friends "usually drink alcohol as often as once a week," and whether they "had tried cannabis" (yes/no). Both scales had values 0–2. We also asked about the proportion of friends who were "at least one year older than you" (from "none" to "all or almost all"). We collected data on school grades and dropping out from high school; and from the national registers we obtained information on whether they had received unemployment or disability pensions the year before the fourth data collection (age 28). Finally, religious involvement was measured by four questions relating to religious faith as well as the practice of religion, at a scale from 0 to 8 (for details of measures, see: Pedersen, 2013).

2.3. Analysis

To examine gender differences in how predictors were related to alcohol consumption and binge drinking, we conducted interaction analyses for each predictor in which the predictor, gender and the product of these two variables were included as predictor variables in linear regression analyses, controlling for age.

Correlation analyses and linear regression analyses were used to examine the relationship between predictors and the dependent variables of alcohol consumption and binge drinking. We tested three linear regression models. First, to examine how each predictor was related to the dependent variables, we conducted separate analyses for each predictor, controlling for age and gender (Model 1). Second, all predictors were included simultaneously in another regression analysis to examine the combined effect of the predictors on the dependent variables (Model 2). In these analyses, a backward elimination procedure was used to remove variables from the model that did not significantly predict the dependent variables. Finally, a third model was tested. Here, the same alcohol measure that was used as dependent variable at age 28, was also included as predictor variable, measured at age 17, thereby giving an autoregressive model of change. In this way, the analyses could show how predictors were related to changes in alcohol consumption and binge drinking from age 17 to 28. Additional logistic regression analyses were conducted using dichotomous measures of alcohol intoxication in these same three models. To test for multicollinearity, the Variance Inflation Factor (VIF) was computed for all variables in all multiple regression analyses. The VIF was below 2 in all analyses, indicating no problems with multicollinearity.

In all regression analyses, maximum likelihood estimations robust to deviations from normality were used to account for alcohol consumption and binge drinking, which is nonnormally distributed in the population. Moreover, additional analyses were run where alcohol consumption scores were log transformed, since the distribution of this variable was particularly skewed. Missing data were handled by a full-information maximum likelihood (FIML) procedure, which has been recommended as especially appropriate to handle missing data (Shafer and Graham, 2002). Standard errors and fit indices were computed by taking into account that students were clustered within schools. For this purpose, potential non-independence of observations due to school clusters was addressed by estimating parameters by maximizing a weighted log-likelihood function, whereas standard error estimations were performed with a "sandwich estimator" (Muthén and Muthén, 2012). The level of significance was set to $p < .01$ to account for the relatively large sample size and the multiple analyses conducted. The statistical program Mplus 7.0 (Muthén and Muthén, 2012) was used for all analyses.

3. Results

Descriptive statistics of the six different alcohol measures used in this study are reported in Table 1. In the first three rows, mean scores for alcohol consumption, intoxication frequency, and frequency of 5+ unit episodes are presented. In the last three rows, we report the proportion of respondents that "usually" drink above various cutoffs: 5–6 units, 7–8 units, and 10+ units. Males reported clearly higher scores than females on all measures, and note that a high proportion (57% of the total sample) report that they "usually" drink 5–6 units or more.

Interaction analyses showed no gender differences in how the predictors were related to binge drinking at age 28. In contrast, males and females differed in how school grades and unemployment were related to alcohol consumption ($p < .01$), but no other gender differences were found. However, the differences in standardized regression coefficients for alcohol consumption between females and males for these two predictors were rather small (grades, females: $\beta = .05$, $p = .06$; grades, males: $\beta = -.08$, $p = .04$; unemployment, females: $\beta = -.05$, $p = .05$; unemployment, males: $\beta = .09$, $p < .01$). Therefore, we combined the data from females and males in all further analyses.

In Table 2, we present the explanatory variables used in the analyses, and their partial correlations, controlled for age and gender, with the two dependent variables of alcohol consumption and binge drinking (i.e. alcohol intoxication frequency), measured at ages 17 and 28. There were significant associations with, e.g. parental monitoring and support, as well as with several measures of parental drinking behavior. Peers' alcohol and cannabis use were also significantly related to both dependent variables. Moreover, there were clearly significant associations to religious involvement, but weaker associations to school dropout, unemployment, and disability pension.

In Table 3, we report linear regression models, with parental, peer and individual characteristics as predictor variables and alcohol consumption and binge drinking at age 28 as dependent variables. First, note that the stability of binge drinking ($\beta = .28$, $p < .001$) was higher than for alcohol consumption ($\beta = .12$, $p < .001$) over the period from 17 to 28 years. Model 1 showed that parental alcohol consumption and binge drinking predicted respondents' alcohol consumption and binge drinking at age 28, bivariate. Several other variables, including parental education level, mother's support, best friend's alcohol and cannabis use and religious involvement predicted consumption and binge drinking as well. In the multivariate models (Models 2 and 3), a double pattern of parental influences was revealed: (i) parental alcohol consumption predicted respondents' alcohol consumption ($p < .001$); and

Table 1
Descriptive statistics for six measures of alcohol use at age 28.

	Total sample $N = 2558$	Males $N = 1136$	Females $N = 1422$
Alcohol consumption (number of "drinks"), past four weeks (range 0–100) Mean (SD)	21.4 (25.9)	30.0 (30.1)	14.3 (19.2)
Intoxication frequency, past 12 months (range 0–5) Mean (SD)	2.5 (1.5)	2.9 (1.4)	2.1 (1.5)
Frequency of 5+ unit episodes, past 12 months (range 0–5) Mean (SD)	1.8 (1.3)	2.3 (1.3)	1.4 (1.1)
"Usually" drinks 5–6 units or more, N (%)	1373 (57.0)	768 (70.7)	605 (45.7)
"Usually" drinks 7–8 units or more, N (%)	783 (32.5)	544 (50.0)	239 (18.1)
"Usually" drinks 10 units or more, N (%)	305 (12.7)	249 (22.9)	56 (4.2)

Note: Significant gender differences for all measures of alcohol use (all $p < .001$).

Table 2
Descriptive statistics and partial correlations between explanatory variables and alcohol consumption and binge drinking at ages 17 and 28. Control for age and gender.

	Descriptive statistics		Partial correlations controlled for age and gender			
	Mean	SD	Alcohol consumption past four weeks		Binge drinking past 12 months	
			Age 17	Age 28	Age 17	Age 28
Family and parents						
Parental education level (0–3)	1.51	.83	–.10**	.09**	–.06*	.08*
Parental divorce (0–1)	.28	.45	.09**	.00	.13**	.02
Parental alcohol consumption (0–12)	1.28	1.99	.05	.13**	.12**	.13**
Parental binge drinking (0–12)	2.45	2.40	.20**	.10**	.30**	.16**
Father's alcohol problems (0–4)	.36	.91	.07*	.03	.09*	.02
Mother's alcohol problems (0–4)	.12	.52	.01	.05	.09**	.06
Parental monitoring (0–18)	6.50	3.70	–.19**	–.05	–.24**	–.09**
Mother's support (0–4)	2.26	1.31	–.17**	–.09**	–.20**	–.09**
Father's support (0–4)	1.70	1.31	–.12**	–.07*	–.16**	–.07*
Family-oriented leisure (0–14)	3.34	2.65	–.16**	–.05	–.21**	–.09**
Peers						
Older friends (0–3)	.71	.99	.12**	.04	.18**	.03
Best friend's alcohol use (0–2)	.33	.64	.40**	.14**	.41*	.12**
Best friend's cannabis use (0–2)	.16	.46	.30**	.08*	.31**	.11**
Individual characteristics						
Religious involvement (0–8)	1.76	2.33	–.23**	–.11**	–.37**	–.16**
School grades (4–18)	10.70	2.12	–.17**	–.01	–.17**	–.01
Drop out of high school (0–1)	.16	.37	.08*	.01	.08*	–.01
Disability (0–1)	.05	.22	.06	–.04	.05	–.02
Unemployment (0–1)	.16	.36	.04	.03	.03	–.01
Age ^a (14–21)	16.88	1.71	.23**	–.12**	.37**	–.14**
Gender ^a (0–1)	.56	.50	–.14**	–.30**	.00	–.25**

^a Not controlled for age and gender.

* $p < .01$.

** $p < .001$.

(ii) parental binge drinking predicted respondents' binge drinking ($p < .001$). The positive association with parental education level for both dependent measures also remained in Models 2 and 3, implying that respondents with well-educated parents had increased

likelihood for high alcohol consumption as well as binge drinking, even when controlling for a variety of covariates, including previous alcohol consumption and binge drinking ($p < .001$). There were no associations with respondents' grades, high school dropout

Table 3
Multiple regression analyses with explanatory variables predicting alcohol consumption and binge drinking at age 28.

	Alcohol consumption at age 28			Binge drinking at age 28		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Family and parents						
Parental education level	.08**	.08**	.08**	.08**	.12**	.12**
Parental divorce	.03			.06*		
Parental alcohol consumption	.12**	.09**	.09**	.14**		
Parental binge drinking	.09**			.17**	.13**	.10**
Father's alcohol problems	.03			.05		
Mother's alcohol problems	.03			.06		
Parental monitoring	–.03			–.09**		
Mother's support	–.07**	–.06*	–.05*	–.07**		
Father's support	–.04*			–.06**		
Family-oriented leisure	–.05			–.11**	–.08**	–.05*
Peers						
Older friends	.02			.01		
Best friend's alcohol use	.12**	.09**	.07*	.14**	.08**	
Best friend's cannabis use	.08*			.12**		
Individual characteristics						
Alcohol consumption at age 17	.12**		.08*			
Binge drinking at age 17				.28**		.21**
Religious involvement	–.08**	–.06*		–.19**	–.15**	–.10**
School grades	.00			.00		
Drop out from high school	–.01			–.02		
Disability	–.04			–.03		
Unemployment	.03			.00		
Age	–.12**	–.15**	–.16**	–.14**	–.19**	–.25**
Gender	–.30**	–.28**	–.27**	–.25**	–.23**	–.23**

Note: Model 1: Bivariate analyses with control for age and gender only; Model 2: Multiple regression analyses (all predictors included simultaneously); Model 3: As Model 2, with additional inclusion of alcohol consumption/intoxication frequency at age 17.

* $p < .01$.

** $p < .001$.

or history of unemployment or disability pensions in any model. Moreover, in the multiple regression models, religious involvement was negatively associated with subsequent binge drinking ($p < .001$), but the relationship was not significant for alcohol consumption in the final model with control for earlier alcohol consumption. Peers' alcohol use remained a significant predictor of alcohol consumption in all three models ($p < .001$). However, peers' alcohol use was not a significant predictor in the binge drinking model, when controlling for previous binge drinking. As the alcohol consumption variable was skewed, we conducted new analyses with log transformations of this variable. However, this resulted in the same overall structure of the findings.

We then re-estimated the models reported in Table 3, using 5+ units of alcohol consumption as an alternative proxy for binge drinking. The same pattern was revealed, and the standardized coefficients for parental binge drinking were $\beta = .20$, $\beta = .13$ and $\beta = .12$ in the three models, respectively (all $p < .001$).

Finally, logistic regression analyses were conducted in which we used different cutoffs for "the usual amount you drink": 5–6+ units, 7–9+ units and 10+ units as dependent variables. Parental binge drinking was once more a highly significant predictor in all three models for all three cutoffs (all $p < .001$).

4. Discussion

4.1. Main findings

In this study, a population-based sample of respondents was followed from their mid teenage years until their late 20s. The respondents' own reports were combined with data obtained from national registers. Thus, we were able to shed light on the long-term effects of childhood and adolescent influences relevant to the development of alcohol consumption patterns. We found that (i) parents' frequency of alcohol consumption predicted the frequency of alcohol consumption in their offspring at age 28; and (ii) binge drinking in parents predicted binge drinking in their offspring at age 28. These results were obtained even when controlling for a variety of covariates associated with other parental influences, peers, educational career, and emerging marginalization processes. In previous research, binge drinking has been operationalized in different ways. In the present study, we were able to distinguish between the experience of alcohol intoxication and the intake of x number of alcohol units on a specific occasion. Using the latter approach, we were able to specify different cutoffs: 5+ units, 5–6+ units, 7–9+ units and 10+ units. All approaches revealed the same results: parental binge drinking predicted young adult binge drinking.

Our findings echo previous studies suggesting there are higher levels of binge drinking among males than females. However, whereas previous studies have revealed gender-specific socialization patterns, we found that males and females are influenced by parental alcohol-related behaviors in the same way.

This study has several strengths. We used a population-based sample, a long follow-up period, well-validated measures, and register data to strengthen the database. However, there are also limitations. Even though we had an acceptable response rate, persons from lower socioeconomic strata are underrepresented in the study. Thus, one should be careful in the interpretation of associations related to social class. Further, even if adolescents' report of parental alcohol problems seem to have acceptable validity (Cowley and Gordon, 1995; Crews and Sher, 1992), self-reports from the parents themselves on all aspects of their alcohol consumption would have been an advantage. Also, even though we controlled for many potential confounding variables, there may still be unmeasured confounds. Perhaps most importantly, we were not

able to control for the impact of shared genes between parents and offspring on binge drinking and alcohol consumption. Thus, we do not know whether the predictors reported here reflect social causal influences, genetic relatedness, or whether they are explained by unmeasured confounding variables.

4.2. Parental influences

Previous studies suggest that parental monitoring and support play an important role in the alcohol socialization process. Indeed, we also found strong cross-sectional associations between such measures and alcohol consumption as well as binge drinking during adolescence. However, a new finding in this study is that the associations of parental monitoring and support with alcohol measures were considerably lower in models that captured development into the respondents' late 20s. This finding supports the notion that parental monitoring and support is of particular importance in adolescence, whereas these factors are of less importance in predicting drinking behavior later in life when young adults have developed to be more independent from their parents. Our findings suggest that the most important factors in the alcohol socialization process are parental alcohol behavior. Alcohol habits with high frequency but low intake per occasion seem to be transmitted to offspring in the same manner as binge drinking, and these drinking practices followed our respondents into adulthood.

Drinking to excess has been linked to traditional working class masculinity (De Vissier and Smith, 2007), and a number of studies suggest that dropping out of school and a low level of education are also characteristics of binge drinkers (Droomers et al., 1999; Laukkanen et al., 2001; Wichstrøm, 1998). In our study, poor school performance and problems in the labor market did *not* predict subsequent binge drinking. Moreover, a high level of parental education was positively associated with offspring's binge drinking in young adulthood. A previous study reported that a high educational level and family affluence were associated with increased rates of teenage drunkenness (Richter et al., 2006), and several studies suggest that this may also be the case in young adulthood (Humensky, 2010; Livingston et al., 2008). Another confounding factor may be that those from lower social classes marry and become parents earlier than those from more socioeconomically privileged backgrounds (Wiig, 2009). This change of social role is usually associated with reduced alcohol consumption. These social class-related associations should be explored more fully in subsequent studies.

4.3. Binge drinking cultures

Norway is characterized as a binge drinking country, and our findings indeed revealed a high rate of binge drinking among young adults: 57% "usually" drink 5–6 units or more. Among males, almost one in four "usually" drinks 10+ units. This is clearly above results from the USA (Courtney and Polich, 2009). These patterns may echo recent developments also witnessed in other European countries, such as the UK, which has been dubbed the "new culture of intoxication". A central feature has been the habit of drinking "shots" and the emergence of a new type of café bars (Measham and Brain, 2005), broadening the customer base beyond the traditional pub clientele of white working-class males (Griffin et al., 2009). In Norwegian cities, such patterns have also been witnessed (Buvik and Baklien, 2012). It has been suggested that these new patterns of binge drinking are fashion-related, with imitative behavior spreading across networks (Ormerod and Wilthire, 2009). However, our study indicates that such diffusion models may be too simple. Early parental influences may also play a role in the development of adult binge drinking practices.

4.4. Conclusion

The present study uncovered high rates of binge drinking among young adults in Norway. To some degree this may reflect cultural influences and what has been coined as “a new intoxication culture”. Irrespective of such influences, our study suggests that binge drinking practices seem to be transmitted from one generation to the next.

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Conflict of interest

None of the authors have any conflicting interests.

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